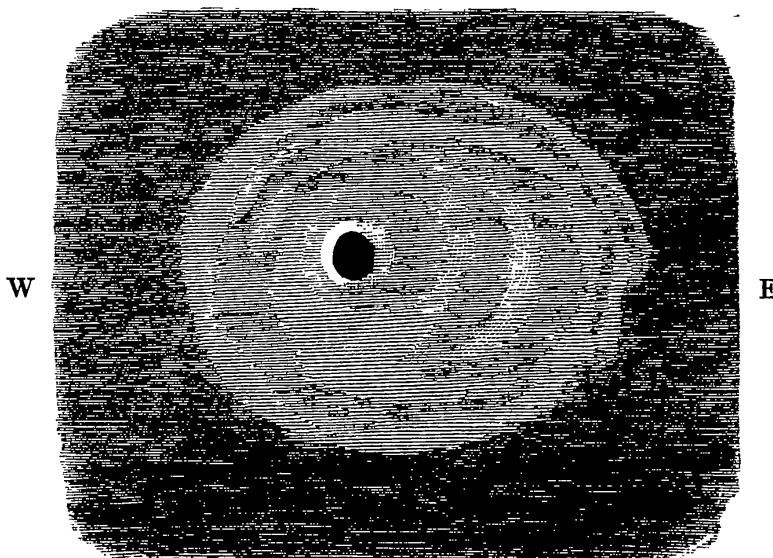


Note on the Lunar Crater Linné.
By William Huggins, Esq., F.R.S.

The diagram which accompanies this note represents the Crater *Linné* as it appeared in the telescope on May 11th, 1867. The unusual steadiness of the atmosphere permitted the small Crater upon *Linné* to be seen with great distinctness.

May 11th, 1867.



8h. 45m.

Linné on this occasion presented the appearance of an oval white patch on the darker background of the *Mare Serenitatis*. The character of the surface of the white spot may be described as similar in appearance to that of a cloud, for it presented no distinct details, and remained undefined when the small neighbouring craters were seen with great clearness. The absence of any defined points upon which the eye can rest is probably the reason that the "boiling" motion of our atmosphere is perceived in a much more marked manner over the white spot, than on the adjoining sharply defined parts of the Moon's surface. From this cause *Linné* appeared, on several occasions, as a mass of white cloud in motion, at the same time that the craters near it were seen steadily and with distinctness. This cloudy appearance arises probably from a peculiar, partly reflective property of the material of which *Linné* consists. Some other portions of the Moon's surface reflect light in an analogous manner.

At the time when the diagram was made, the shallow, saucer-like form of *Linné* was not seen, but I have detected it on other occasions. On the evening of July 8, at 7^h, when

a great part of the light reflected from our atmosphere was removed by means of a Nicol's prism placed next to the eye, I observed a shadow within the western margin of the shallow crater.

In the centre nearly of *Linné*, but rather nearer to the western margin, was seen the small Crater, as it is represented in the diagram.* This object was well defined in the telescope. The interior of the small Crater was in shadow, with the exception of a small part of it towards the east. The margin of the small Crater was much brighter on the western side, and at this part appears to be more elevated above the surface of *Linné*. Under very oblique illumination this high western wall appears as a small brilliant eminence, and casts a shadow which is somewhat pointed. In consequence of the presence of visitors in my observatory, I did not take measures of the small Crater. I estimated its diameter to be rather greater than one-fourth of the diameter of the white spot.

On the evening of July 9, at 9^h, the following measures were taken of *Linné*, and of the small interior crater. Under a power of 500 diameters, with which the measures were made, the boundary of *Linné* does not end abruptly, but passes gradually into the darker surface of the *Mare Serenitatis*. The white spot is oblong, but is not a regularly formed oval. At some parts of its outline small projecting portions of the bright surface interrupt the regularity of its figure.

The small crater, which appears to be deep, has a narrow margin, brighter than the white spot on which it occurs. The measures of this crater include the narrow, bright margin.

Length of the bright spot	7'85
Breadth	6'14
Diameter of the small centre ..	1'71

1866, Dec. 14th. I observed the Moon with a Savart's polariscope attached to the telescope. The coloured bands passed unbroken across *Linné*, which appeared at the time as a white spot. Also when a double-image prism and plate of quartz were used, *Linné* was coloured similarly to the adjoining parts. The light from *Linné* contained a smaller amount of polarized light.

1867, Feb. 14th. I examined carefully the spectrum of the light reflected from *Linné*. The small size of the object makes this observation somewhat uncertain. The lines of Fraunhofer were seen with great distinctness in the spectrum of the Moon's light; but I failed to detect any lines which do not belong to solar light, in the narrow, brighter spectrum which was formed by the light from *Linné*.

Herr Schmidt is of opinion that a great change has recently taken place in the appearance of *Linné*, when it is viewed

* In the woodcut, the crater is a little too small in proportion to the white spot.

under oblique illumination. This conclusion is based upon a comparison of its present appearance with the descriptions of Lohrmann and Mädler, and with Herr Schmidt's own observations from 1841 to 1843.*

On this account it is of importance to note that the earlier observations by Schröter seem to agree very closely with the appearance which *Linné* now presents.

In Plate IX. of Schröter's *Selenotopographische Fragmente* the place occupied by *Linné* is marked by a round white spot, and not by the figure of a Crater. This white spot is a little smaller than the figure of the Crater *Sulpicius Gallus*. The spot is distinguished on the Plate by the letter *v*.

At page 181, Schröter gives the following description of this object: "Die sechste Bergader kommt von einer fast dicht an den südlichen Gränzgebirgen befindlichen, verhältnissmäßig gezeichneten Einsenkung *u*, streicht nördlich nach *v*, woselbst sie wieder eine ohngefähr gleich grosse, aber ganz flache, als ein weisses, sehr kleines rundes Fleckchen erscheinende, etwas ungewisse Einsenkung in sich hat"

I have put in Italics the words which apply to *Linné*. The observation was made, 1788, Nov. 5th, from 4^h 30^m to 8^h. The mean time of the observations was 7 days 14 hours after new Moon. Schröter employed a power of 161 on his 7-foot reflector.†

The description of this object as "a flat, somewhat doubtful Crater, which appears as a round white spot," agrees remarkably with the appearance which *Linné* now presents under similar conditions of illumination. The absence of any mention by Schröter of the small interior Crater, cannot be regarded as evidence of much weight, that this little Crater has been subsequently formed. An object so small might easily have been overlooked by Schröter. However, Lohrmann's description, in 1823,‡ and that of Mädler in 1831, do not appear to be in accordance with Schröter's observations, or with the present condition of the object.§ The observations were made with a refractor of 8 inches aperture, and with various powers from 200 diameters to 800 diameters.

* *Monthly Notices*, vol. xxvii. p. 93. *Ast. Nachrichten*, No. 1631. *Sitzungsberichte der K. Akademie, Wien*, Bd. iv., Feb. 1867.

† For his measures of the *Mare Serenitatis*, Schröter employed a reduced power of 95 diameters. In his second volume, at page 276, he gives an account of a re-examination of this part of the Moon's surface with more powerful telescopes. On this occasion (see Tab. LXIX.) *Linné* was not observed, probably because it was too close to the terminator. Schröter remarks, ". . . indem noch nicht einmahl die ganze Fläche erleuchtet war, sondern die Lichtgränze östlich durch sie vor den östlichen Gränzgebirgen weg lag."

‡ "A is the second Crater upon this plain—has a diameter which exceeds somewhat 1 mile, is very deep, and can be seen under every illumination." *Topographie der Mondoberfläche*, p. 92, and Plate, Section iv.

§ A series of careful observations has been made by Prof. Respighi, *Les Mondes*, 13 Juin, 1867. See also observations of M. Flammarion, *Comptes Rendus*, Mai 20, 1867, and of M. Wolf, *Comptes Rendus*, Juin 17, 1867.